

**TECHNICAL DATA** 

# Fluke 190 Series III ScopeMeter<sup>®</sup> **Test Tools**













#### SAFETY RATED FOR INDUSTRIAL **ENVIRONMENTS**

CAT III 1000 V/CAT IV 600 V rate portable oscilloscopes with up to four independent floating isolated inputs

#### **AUTOMATICALLY CAPTURE, VIEW AND ANALYZE COMPLEX WAVEFORMS**

Connect-and-View™ triggering automatically displays waveforms without having to adjust amplitude, timebase and trigger settings.

#### **EASILY VIEW MEASUREMENTS IN THE FIELD** OR ON YOUR PC

Large, bright color display for easy in-the-field viewing and both USB and Wi-Fi data download options for analyzing data with FlukeView® software

### **High performance portable oscilloscopes** engineered for harsh environments

Fluke 190 Series III ScopeMeter Test Tools are engineered to go where you go, and tackle just about any troubleshooting job along the way. These CAT III 1000 V/CAT IV 600V rated test tools combine rugged portability with the high performance of bench oscilloscopes to help you take on the challenges of installing, commissioning and maintaining industrial machinery, automation and process controls, and power conversion electronics with easefrom DC to 500 MHz.

Choose from two or four channel models with a wide range of bandwidth options. Fast sampling rates up to 5.0 GS/s, 200 ps resolution and deep memory of 10,000 samples per channel allow high-accuracy capture and display of waveform details, noise, and other disturbances. Perform timing or amplitude related measurements on three phases or three-axis control systems, or simply compare and contrast multiple test points in a circuit under test. Features like TrendPlot™ Paperless Recorder, ScopeRecord™ Mode, Connect-and-View<sup>™</sup> Triggering and a unique 100-screen Replay function help you quickly diagnose issues to minimize repair costs and downtime. These features make the oscilloscopes easy to use especially when diagnosing the most difficult problems like complex waveforms, induced noise, intermittent events and signal fluctuations or drift.

- Up to four independent floating isolated inputs, up to 1000 V
- Up to 5 GS/s real time sampling (depending on model and channels used)
- Deep memory: 10,000 points per trace waveform capture (scope mode)
- CAT III 1000 V/CAT IV 600 V safety rated instrument for industrial environments
- Up to seven hours of battery operation using BP291
- Large, bright color display is easy to view in nearly any environment
- Easy to store and view historical data and transfer to a PC via USB or Wifi
- Convenient battery access door for quick battery swaps in the field
- IP51 rating, dust and drip-proof
- Connect-and-View triggering for intelligent, automatic triggering on fast, slow and even complex signals
- Frequency spectrum using FFT-analysis
- Automatic capture and REPLAY of 100 screens
- ScopeRecord mode gives 30,000 points per input channel for low frequency signal analysis
- TrendPlot Paperless Recorder mode with deep memory for longterm automatic measurements
- 5.000 count DMM included in the 2-channel models



#### Measure from mV to kV safely

Independently isolated inputs allow you to make measurements in mixed circuits having different ground references reducing the risk of accidental short circuits. Conventional bench oscilloscopes without special differential probes and isolation transformers can only reference measurements to line power earth ground. ScopeMeter 190 Series III test tools are engineered to cover a wide application range from mV to kV, so you're ready for anything from microelectronics to heavyduty higher voltage electrical applications. 190 Series III 60MHz and 100MHz configurations include VPS421 100:1 probes for higher voltage applications, while the 200MHz and 500MHz configurations include VPS410-II 10:1 probes suitable for both microelectronics and higher voltage applications.

#### IP-51 rated for harsh environments

Rugged and shock-proof, ScopeMeter Test Tools are built for dirty, hazardous environments. With its sealed case, it can endure dust, drips, humidity and airborne pollutants. Every time you reach for ScopeMeter Test Tool you can be confident it will work reliably wherever your work takes you.

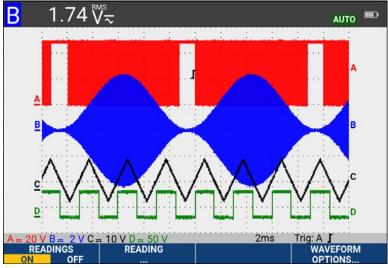
### **USB and Wi-Fi connectivity**

The Fluke 190 Series III offers two USB ports, electrically isolated from measurement input circuits allowing you to quickly and easily transfer data to a PC, archive and share waveforms with OEMs, colleagues and support staff, or store waveforms, screen captures and instrument setups onto USB memory devices for later use. Easily transfer saved files via USB stick, direct connection via the USB interface or optional Wi-Fi connectivity. These files can be used for further data handling or in FlukeView-2 Software to study waveforms in greater detail.

#### **Connect-and-View triggering**

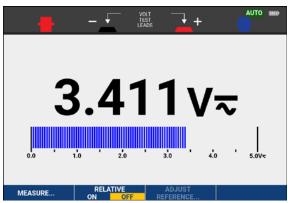
Connect-and-View triggering provides an instant, stable display without the need for adjusting settings. If you've used other scopes, you know how tricky triggering can be. If settings are incorrect, results can be unstable or incorrect. Connectand-View automatically sets up correct triggering by recognizing signal patterns. Without touching a button, you get a stable, reliable and repeatable display of virtually any signal including motor drive and control signals. It's especially fast and convenient when you're measuring a number of test points in rapid succession.





Connect and View captures even the most complex signals without requiring additional setup

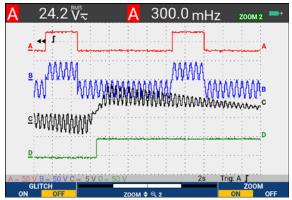




The built-in multimeter provides convenient precision measurements

### **Built-in digital multimeter**

Conveniently switch from waveform analysis to precise multimeter measurements using the built in 5000 count digital multimeter on two channel 190 Series III models. Measurement functions include Vdc, Vac, Vac+dc, resistance, continuity and diode test. Measure current and temperature using suitable shunt, probe or adapter with wide range of scaling factors.

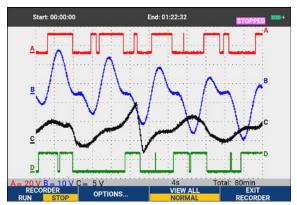


Capture high-resolution waveform details over extended period using ScopeRecord™ mode

### ScopeRecord™ mode for high resolution waveform recording

ScopeRecord memory stores up to 30,000 or more data points per channel, capturing fast intermittent events and glitches as short as 8 ns. (Two sets of multiple channel recordings can be stored to internal memory for later analysis.)

- Records events like UPS, power supply or motor start-up cycles
- With the Stop on Trigger mode, the ScopeMeter Test Tool automatically recognizes a power failure and stores the waveform data preceding it



Trend multiple measurements capturing signal intermittent events, signal drift or fluctuations

### TrendPlot paperless recorder records up to 11 days to help you find intermittent faults

The toughest faults to find are those that happen only once in a while. These intermittent events can be caused by bad connections, dust, dirt, corrosion, or simply broken wiring or connectors. Line outages, dips, swells and interruptions, or the starting and stopping of a motor can also cause a machine to stop. You may not be around when it happens, but the Fluke 190 Series III ScopeMeter Test Tool will be.

- Plot minimum and maximum peak values and average over time
- Plot any combination of up to four readings including voltages, amps, temperature, frequency and phase for all inputs, all with time and date stamp to pinpoint faults



### FlukeView™ 2 ScopeMeter software for documenting, archiving and analysis

Get more out of your ScopeMeter Test Tool with FlukeView 2 ScopeMeter Software for Windows.

- Documentation—transfer waveforms, screens and data to your PC for printing or importing data into a report
- Add text to ScopeMeter Test Tool settings—give operators guidance when recalling settings
- Archive—create a library of waveforms for easy reference, or waveform comparison
- Analysis—use cursors or export data to another analysis program



FlukeView-2 ScopeMeter software

## Oscilloscope modes

	190-062	190-102	190-202	190-502	190-104	190-204	190-504		
Vertical defle	ection								
Number of channels	2	2	2	2	4	4	4		
Bandwidth	60 MHz	100 MHz	200 MHz	500 MHz	100 MHz	200 MHz	500 MHz		
Rise time	5.8 ns	3.5 ns	1.7 ns	0.7 ns	3.5 ns	1.7 ns	0.7 ns		
Number of scope inputs	2	input channels p	lus external trigge	er		4 input channels			
Channel architecture	All inpu	uts fully insulated	from each other a	nd from ground. In	nputs may be acti	vated in any comb	oination		
Input coupling	AC or DC, with ground level indicator								
Input sensitivity	With 10:1 probe, 20 mV to 1000 V/div With 100:1 probe, 200 mV to 10 kV/div Direct (1:1), 2 mV to 100 V/div								
Bandwidth limiter		20 MHz and 10 kHz							
Polarity			Norr	nal, Inverted, Vari	able				
Input voltage		CAT III 1000	V/CAT IV 600 V ra	ited, see General s	specifications for f	urther details			
Vertical resolution	8 bit								
Accuracy at 4 s to 10 μs/div	5 mV/div to 100 V/div, $\pm$ (1.5 % + 6 counts) 2 mV/div, $\pm$ (1.5 % + 10 counts)								
Input impedance			1 MΩ (±	1 %) // 15 pF (± 2	2.25 pF)				



# Oscilloscope modes (continued)

	190-062	190-102	190-202	190-502	190-104	190-204	190-504
Horizontal							
Maximum real- time sample rate (sampled simultaneously)	625 MS/s (each channel)	1.25 GS/s (each channel)	2.5 GS/s (each channel)	5 GS/s (single channel) or 2.5 GS/s (dual channel)	1.25 GS/s (each channel)	2.5 GS/s (2ch) 1.25 GS/s (4ch)	5 GS/s (single ch) or 2.5 GS/s (2ch) or 1.25 GS/s (4ch)
Record length			Up to 10	,000 samples per	channel		
Time base	10 ns/div to 4 s/div	5 ns/div to 4 s/div	2 ns/div to 4 s/div	1 ns/div to 4 s/div	5 ns/div to 4 s/div	2 ns/div to 4 s/div	1 ns/div to 4 s/div
range		Slower time/di		ase in a 1-2-4-se ing ScopeRecord™	quence Roll mode (see 'R	ecorder mode')	
Maximum record length		30,000 poir		oles per channel ir ScopeRecord™ Ro	n scope mode bll mode (see 'Reco	order mode')	
Timing accuracy			± (0.0)	1 % of reading +	l pixel)		
Glitch capture			8 ns	(10 μs/div to 2 min	n/div)		
Display and a	acquisition						
Display		133 r	nm x 90 mm (5.3	in x 3.5 in) full-co	lor high brightnes	s LCD	
Display modes			Any combination	of channels; avera	age on/off; replay.		
Visible screen width			12 division	ns horizontally in s	scope mode		
Digital persistence modes			Off, short, medium	m, long, infinite ar	nd envelope mode		
Waveform mathematics	One				on 2 input channoncy Spectrum usir		d D):
Acquisition modes					lecord™ roll, glitch s/Fail testing"; Re		
Trigger and	delay						
Source	Ir	nput A, B or Extern	nal (via meter inpu	ut)		Input A, B, C or D	
Modes		Au	itomatic, Edge, Pu	lse Width, N-Cycle	e, External (190-xx	x2)	
Connect-and- View™			tically displays st		natically sets up ar f complex and dyn off if preferred.		
Pulse width triggering (on channel A)	Pulse width qualified by time Allows for triggering $<$ t, $>$ t, $=$ t, where t is selectable in minimum steps of 0.01 div or 50 ns						
Time delay	1	full screen of pre-	-trigger view or up	to 100 screens (=	=1,200 divisions) (	of post-trigger del	ay
Dual slope triggering			Triggers on bo	oth rising and falli	ng edges alike		
N-cycle triggering		Triggers on I	N-th occurrence o	f a trigger event; N	I to be set in the r	ange 2 to 99	



## Oscilloscope modes (continued)

<b>Automatic</b>	capture o	f 100	screens
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When in oscilloscope mode, the instrument ALWAYS memorizes the last 100 screens—no specific user setup required. When an anomaly is seen, the REPLAY button can be pressed to review the full sequence of screen events over and over. Instrument can be set up for triggering on glitches or intermittent anomalies and will operate in "baby-sit" mode capturing 100 specified events.

	Manual or continuous replay. Displays the captured 100 screens as a "live" animation, or under manual control. Each screen has date and time-stamp.
Reniati storage	Ten sets of 100 screens each can be saved internally for later recall and analysis. Direct storage of additional sets on external flash memory drive through USB host port.

#### FFT—frequency spectrum analysis

Shows frequency content of oscilloscope waveform using Fast Fourier Transform						
Window	Automatic, Hamming, Hanning or None					
Automatic window	Digitally re-samples acquired waveform to get optimum frequency resolution in FFT resultant.					
Vertical scale	Linear/Logarithmic (in volts or amps)					
Frequency axis	Frequency range automatically set as a function of timebase range of oscilloscope					

## Waveform compare and pass/fail testing

Waveform compare	Provides storage and display of a reference waveform for visual comparison with newly acquired waveforms. Reference is derived from an acquired waveform and can be modified in the oscilloscope.				
Pagg/Fall tegting	In waveform compare mode, the oscilloscope can be set up to store only matching ("Pass") or only non-matching ("Fail") acquired waveforms in the replay memory bank for further analysis.				

#### **Automatic scope measurements**

V dc, V ac rms, V ac+dc, Vpeak max, Vpeak min, Vpeak to peak, A ac, A dc, A ac+dc, frequency (in Hz), rise time (using cursors), fall time (using cursors), Power Factor (PF), Watts, VA, VA reactive, phase (between 2 inputs A&B or C&D), pulse width (pos./neg.), duty cycle (pos./neg.), temperature  $^{\circ}$ C, temperature  $^{\circ}$ C (not for Japan), dBV, dBm into 50  $\Omega$  and 600  $\Omega$ , VPWM ac and VPWM(ac+dc) for measurement on pulse width modulated motor drives and frequency inverters, V/Hz ratio;

Advanced power and motor drive functions	V/Hz ratio, Power Factor (PF), Watts, VA, VA reactive, V-PWM (ac) and V-PWM (ac+dc) for measurement on pulsewidth modulated motordrives and frequency inverters
Cursor measurements	
Source	On any input waveform or on mathematical resultant waveform (excl. X-Y-mode)
Dual horizontal lines	Voltage at cursor 1 and at cursor 2, voltage between cursors
Dual vertical lines	Time between cursors, 1/T between cursors (in Hz), voltage between markers, risetime with markers, falltime with markers; Vrms between cursors, Watts between cursors.
Single vertical line	Min-Max and Average voltage at cursor position; frequency and rms-value of individual frequency component in the FFT Resultant
Advanced functions	mA*s (current-over-time, between cursors); V*s (voltage over time, between cursors); W*s (energy, between cursors)
ZOOM	Ranges from full record overview to zoom in up to sample level, at any record length.



## **Meter modes**

	190-062	190-102	190-202	190-502	190-104	190-204	190-504			
Meter inputs	Via 4 mm l	panana inputs, ful and scop	lly isolated from so e ground	Via BNC scope inputs						
Number of readings		One at a time	via DMM input		Up to 4 au	tomatic scope mea simultaneously	surements			
Maximum resolution		5,000	counts		(fre	± 999 counts quency: 9999 cou	nts)			
Input impedance		1 MΩ (± 1 %) //	14 pF (± 1.5 pF)		1 MΩ (±	1 %) // 15 pF (±	2.25 pF)			
Advanced meter functions		Auto/manual ra	anging, relative me	easurements (Zero	reference), Trend	Plot™ recording				
		The specified accuracy is valid over the temperature range 18 °C to 28 °C Add 10 % of specified accuracy for each degree C below 18 °C or above 28 °C								
Voltage										
V dc accuracy		± (0.5 % +	+ 6 counts)		<u>+</u>	(1.5 % + 6 count	s)			
V ac true rms ac	rms accuracy									
15 Hz to 60 Hz		± (1 % +	10 counts)		± (1.5 % + 10 counts)					
60 Hz to 1 kHz		± (2.5 % +	15 counts)		_					
60 Hz to 20 kHz		-	_		± (2.5 % + 15 counts)					
V ac+dc true rm	s accuracy									
15 Hz to 60 Hz		± (1 % +	10 counts)		± (1.5 % + 10 counts)					
60 Hz to 1 kHz		± (2.5% +	15 counts)		-					
60 Hz to 20 kHz		-	_		± (2.5 % + 15 counts)					
Voltmeter ranges		500 mV, 5 V, 50	V, 500 V, 1,100 V							
Resistance										
Ranges	500	Ο Ω, 5 kΩ, 50 kΩ,	500 kΩ, 5 MΩ, 30	ΜΩ		-				
Accuracy		± (0.6 % -	+ 6 counts)			_				
Other meter	functions									
Continuity		Beeper on <	50 Ω (± 30 Ω)			-				
Diode test		Up to	2.8 V			-				
Current (A)	A dc, A ac, A ac-	+dc using an opti	onal current clamp	o or shunt Scaling	factors: 0.1 mV/A,	1 mV/A to 100 V/.	A and 400 mV/A			
Temperature		W	ith optional acces	sories. Scale facto	rs 1mV/°C or 1mV/	°F				



## **Recorder mode**

	190-062	190-102	190-202	190-502	190-104	190-204	190-504				
ScopeRecord	™ Roll Mode										
Dual or multiple in	nput waveform st	orage mode, using	g deep memory								
Source and display	I	Input A, Input B, Dual Any combination of inputs, up to 4 channels. All channels sampled simultaneously All channels sampled simultaneously									
Memory depth		30,000 da	ta points per chan	nel, each holding	min/max pair of i	information					
Min/max values	Min/max value	s are created at sa	amples that are me	asured at high sa	mple rate ensurin	g capture and dis	play of glitches.				
Recording modes	Single sweep, o		art-on-Trigger (thr (through external)	ough external);		continuous roll; S hannel); Stop-on-T any channel)					
Stop-on-trigger	of		de can be stopped er signal, through a				es)				
Horizontal scale			Time	from start, time of	of day						
Zoom		Ranç	ges from full record	l overview to zoo	m in up to sample	level					
Memory	Two	multiple input So	copeRecord wavefo	orms can be saved	d internally for lat	er recall and anal	ysis.				
ScopeRecord	™ Roll mode	sample rate	and recording	timespan							
Time base range			4	ms/div to 2 min/d	liv						
Recorded timespan				4.8 sec to 40 hr							
Time/division in 'view all' mode			(	0.4 s/div to 4 h/di	V						
Glitch capture				8 ns							
Sample rate				125 MS/s							
Resolution			1	.60 μsec ~ 4.8 se	C						
Trendplot™ R	ecording										
Multiple channel or a DMM-reading		ess recorder. Grap	hically plots, displ	ays and stores res	sults of up to four	automatic scope m	easurements				
Source and display			irements, made on								
Memory depth	19,200 points (	sets) per recordin	g. Each recorded s plus a	ample point conta date- and time-s	ins a minimum, a tamp.	maximum and ar	average value				
Ranges	Norma	view: 5 s/div to	30 min/div; In viev	w-all mode: 5 mir	n/div to 48 hr/div	(overview of total	record)				
Recorded time span		Up to 22 day	ys, with a resolution	n of 102 seconds	; up to 5.5 days fo	r 4 readings.					
Recording mode		Continuous re	ecording, starting	at 5 s/div with au	tomatic time-scale	e compression					
Measurement speed			Three automatic	measurements pe	r second or more						
Horizontal scale			Time	from start, time of	of day						
Zoom		Up to 64x zoon	n-out for full recor	d overview, up to	10x zoom-in for n	naximum detail					
Memory	r	Γwo multiple inpu	t TrendPlot record	s can be saved in	ternally for later r	ecall and analysis					
Cursor measu	irements—al	l recorder mo	des								
Source		Any waveform t	race in any wavefo	orm display mode	(Scope, ScopeRec	ord or TrendPlot)					
Dual vertical lines	Cursors may l	oe used to identify	y Min, Max or Aver time fro	age value of any om start or absolu		ord, with time bet	ween cursors,				



# **General specifications**

	190-062	190-102	190-202	190-502	190-104	190-204	190-504				
Input voltage	e range										
Rated maximum floating voltage	CAT III	CAT III 1000 V / CAT IV 600 V (maximum voltage between any contact and earth-ground voltage level)									
Probe input voltage VPS410-II	CAT III	CAT III 1000 V / CAT IV 600 V (Maximum voltage between standard 10:1 probe tip and reference lead)									
Probe input voltage VPS421	C	AT III 1000V / CA		um voltage between probe tip and		erence lead to GN	D,				
Maximum BNC input voltage		(	CAT IV 300 V (max	kimum voltage on	BNC input directly	)					
Maximum volt- age on meter input	(saf		/ CAT IV 600 V ana input connect	ors)		-					
Memory save	e and recall										
Memory locations (internal)		30 waveform	memories plus 10	recording memori	es plus 9 screen c	opy memories					
30 waveform memories		Each memo	ry can contain up	to 2 or 4 waveform	ns plus correspon	ding setups.					
10 recording memories	Each ma	ay contain: a 100		quence, or a Scope ecording of up to 4		recording (2 or 4	traces),				
External data storage	On PC, u	sing FlukeView™-		rect storage on ext rough USB host po		ry drive (maximur	m 32 GB)				
Screencopies	On PC, using Fluk	xeView™-2 Softw		(in instrument) wh file, through USB		on to external fla	sh memory drive				
Volatility	Saving is	s done in non-vol	atile Flash-ROM a	nd all data is secu	red, independent	of battery or powe	er status.				
Real-time clock	Provides date an	d time stamp info	rmation for Scopel	Record, for 100 Sc	reen Replay seque	ences and for Tren	dPlot recordings.				
Case											
Design	Rugged			ctive holster. Hand o lock down instru			andard.				
Drip and dust proof			IP 51	according to IEC6	0529						
Shock and vibration	Shoc	k 30 g, vibration (	sinusoidal) 3 g / 0	0.03 g²/Hz (Randor	n), according to M	IL-PRF-28800F Cl	ass 2				
Display size			133 mm x	90 mm (5.3 in x 3	3.5 in) LCD						
Resolution			112	20 pixels x 765 pix	els						
Brightness			User-ad	ljustable, up to 300	O cd/m <sup>2</sup>						
Mechanical (	data										
Size			265 mm x 192 mi	m x 70 mm (10.5 ii	n x 7.6 in x 2.8 in)						
Weight (including battery)		2.1 kg (4.6 lb)			2.2 kg	(4.8 lb)					



# **General specifications (continued)**

	190-062	190-102	190-202	190-502	190-104	190-204	190-504				
Power											
Line power	Universal mains adapter/battery charger BC190/830 included, with detachable 2-wire power cords 100 Vac to 240 Vac, $\pm 10$ %, 50-60 Hz										
Battery power	Re-charge	eable Li-Ion batte	ry (included). Batte	ery swappable thro of the instrument		ible battery door	at the rear				
Battery type (incl.) and capacity [+opt. battery]		90: 10.8V, 2500 1 1 (5000 mAh) op			BP291: 10.8V	, 5000 mAh					
Battery charge indicator	Battery has bui	lt–in status indica	ntor for use with ex	ternal charger, ne	xt to battery statu	s indicator on ins	trument screen.				
Battery operating time (with backlight low)		5 using BP290 (ir ours using BP291		Ü	Jp to 7 hours usinç	g BP291 (included	)				
Battery charging time	2½ hours usi	ng BP290; 5 hour	s using BP291		Five hours	for BP291					
Battery power saving functions			automatic 'display o	n' with adjustable p off' with adjustable en battery power i	power down time						
Safety											
Compliance				-1-2001, Pollution 1 30: CAT IV 600 V /							
Environment	al										
Operating temperature				ring: 0 °C to 40 °C ng: 0 °C to 40 °C (3							
Storage temperature			-20 °C	to 60 °C (-4 °F to 1	140 °F)						
Humidity			10 °C to 30 ° 30 °C to 40 °C	(32 °F to 50 °F): no C (50 °F to 86 °F): C (86 °F to 104 °F): (104 °F to 122 °F)	95 % (±5 %) 75 % (±5 %)						
Maximum operating altitude				III 1000 V: up to 2 V, CAT II 1000 V: ι							
Maximum storage altitude				12 km (40,000 ft)							
Electro- Magnetic Compatibility (EMC)		IEC 61326-1: Industrial; CISPR 11: Group 1, Class A; Korea (KCC): Class A Equipment (Industrial Broadcasting and Communication Equipment): USA (FCC): 47 CFR 15 subpart C.									
Interfaces	Two USB-ports provided. Ports are fully insulated from instrument's floating measurement circuitry.  USB-host port directly connects to external flash memory drive (up to 32 GB) for storage of waveform data, measurement results, instrument settings and screen copies. Alternatively, this USB-A port may be used to connect a V Adapter for wireless PC connectivity. A mini-USB-B is provided which allows for interconnection to PC for remote contained data transfer under PC-control using FlukeView-2.										
Probe calibration output	Dedicated pr	obe-cal output w		act provided, fully to the contract of the con		y measurement in	put channel.				
Warranty		3 уе	ears on main instru	iment, 1 year on b	attery and accesso	ories					



# **General specifications (continued)**

	190-062	190-102	190-202	190-502	190-104	190-204	190-504				
Included accessories											
Battery charger/ mains adapter		BC190/830									
Li-Ion battery pack	BP2	90 (10.8V, 2500 n	nAh)		BP291 (10.8V	7, 5000 mAh)					
Voltage probe sets Each set includes ground lead, hook clip; ground spring and probe tip insulation sleeve with VPS410-II-x.	2 pcs VPS421- industrial-grade 150MHz with s banana tip and la clips (one re	e probes, 100:1, shrouded 4mm arge jaw alligator	probes, 500 N	MHz, (one red, propes, 100:1, pro		probes, 500 N	4 pcs VPS410-II-x, 10:1 voltage probes, 500 MHz, (one red, one grey, one blue, one green)				
Test leads	TL	175 (one red, one	black) with test p	ins		-					
Other	(user selectable f	Li-Ion battery (BP290 or BP291, see above), Battery charger (BC190) with universal power cord set, Hangstrap, Handstrap (user selectable for left- or right hand use), download information for user manual and FlukeView®-2 demo package (with restricted functionality), and USB interface cable for PC connectivity. Feedthrough cable terminator, 50 Ω (one per channel, 190-50x only).									
Optional configuration		Each model is available as a 'boxed' version, described above, or with the optional SCC293 set included. SCC293 comprises: CXT293 rugged protective carrying case, full-version FlukeView PC software (activation code) and a WiFi dongle for wireless PC-connectivity using FlukeView-2 software.									
Optional accessories	TRM	SCC293, VPS101 - 1:1 voltage probe; VPS510-x - wide bandwidth compact probes; i400s-current clamp; HH290-hanging hook; CXT293-protective carrying case; TRM50-BNC Feedthrough cable terminator, 50 Ω, safety designed; EBC290-battery charging bay									





#### **Ordering information**

Fluke 190-504-III Color ScopeMeter, 500 MHz, 4 channels

Fluke 190-504-III-S Color ScopeMeter, 500 MHz, 4 channels, with SCC-293 kit included

Fluke 190-204-III Color ScopeMeter, 200 MHz, 4 channels

Fluke 190-204-III-S Color ScopeMeter, 200 MHz, 4 channels, with SCC-293 kit included

Fluke 190-104-III Color ScopeMeter, 100 MHz, 4 channels

Fluke 190-104-III-S Color ScopeMeter, 100 MHz, 4 channels, with SCC-293 kit included

Fluke 190-502-III Color ScopeMeter, 500 MHz, 2 channel plus DMM/Ext, input

Fluke 190-502-III-S Color ScopeMeter, 500 MHz, 2 channel plus DMM/Ext,

input, with SCC-293 kit included

Fluke 190-202-III Color ScopeMeter, 200 MHz, 2 channels plus DMM/Ext. input

Fluke 190-202-III-S Color ScopeMeter, 200 MHz, 2 channels plus DMM/Ext.

input, with SCC-293 kit included

Fluke 190-102-III Color ScopeMeter, 100 MHz, 2 channels plus DMM/Ext. input

Fluke 190-102-III-S Color ScopeMeter, 100 MHz, 2 channels plus DMM/Ext.

input, with SCC-293 kit included

Fluke 190-062-III Color ScopeMeter, 60 MHz, 2 channels plus DMM/Ext. input

Fluke 190-062-III-S Color ScopeMeter, 60 MHz, 2 channels plus DMM/Ext.

input, with SCC-293 kit included

#### **Accessories**

BC190 Mains adapter/battery charger

BP290 Li-ion battery pack, 2500 mAh

BP291 Li-ion battery pack, 5000 mAh

EBC290 External battery charger for BP290 and BP291 (uses BC190 mains adapter)

CXT293 Rugged Protective Carrying Case, IP67 rated

HH290 Hanging Hook for 190 Series II and III instruments

VPS510-R Electronic Voltage Probe set, 10:1, 500 MHz, one set red

VPS510-G Electronic Voltage Probe set, 10:1, 500 MHz, one set grey

VPS510-B Electronic Voltage Probe set, 10:1, 500 MHz, one set blue

VPS510-V Electronic Voltage Probe set, 10:1, 500 MHz, one set green

VPS410-II-G Industrial Voltage Probe set, 10:1, one set grey

VPS410-II-R Industrial Voltage Probe set, 10:1, one set red

VPS410-II-B Industrial Voltage Probe set, 10:1, one set blue

VPS410-II-V Industrial Voltage Probe set, 10:1, one set green

VPS421-R High working voltage ruggedized probe set, 100:1, 150 MHz, (bicolored, red/black)

VPS421-G High working voltage ruggedized probe set, 100:1, 150 MHz, (bicolored, grey/black)

VPS421-B High working voltage ruggedized probe set, 100:1, 150 MHz, (bicolored blue/black)

VPS421-V High working voltage ruggedized probe set, 100:1, 150 MHz; (bicolored green/black)

MP1-MAGNET PROBE 1-Magnet Probes for 4 mm banana, Set of 4

SCC293 FlukeView-2 ScopeMeter Software package (full version) with CXT293 Carrying Case and WiFi dongle

TL175 TwistGuard™ safety designed test leads set (1 red, 1 black)

**TRM50** BNC Feedthrough 50  $\Omega$  terminator (set of 2 pieces, black)

AS400 Probe Accessory Extension Set for VPS410-series probes

RS400 Probe Accessory Replacement Set for VPS410-series probes

RS421 Probe accessory replacement set for VPS421-series series probes

RS500 Probe Accessory Replacement Set for VPS500-series probes

FlukeView-2 Software for ScopeMeter 190 Series III Test Tools

# Fluke. Keeping your world up and running.®

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